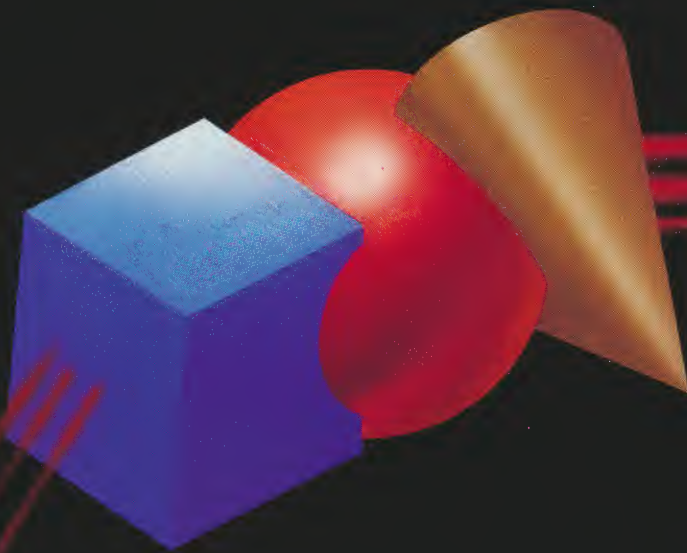


FREEFORM[®]



WRITE ONCE – RUN EVERYWHERE[™]

WRITE ONCE - RUN ANYWHERE

*How Does FREEFORM/U*DB*OS Save Application Development Managers Time And Money Now While Protecting Their Future?*

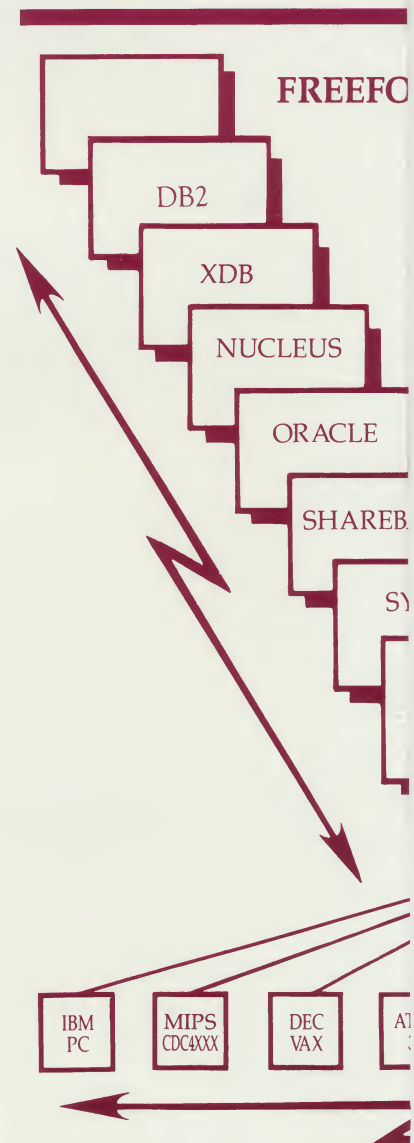
- By achieving database independence for all applications
- By achieving hardware independence for all applications
- By achieving operating system independence for all applications
- By eliminating application conversions between different database servers
- By eliminating application conversions between different computer manufacturers
- By eliminating application conversions between different operating systems
- By providing a common user interface for different computer manufacturers.
- By eliminating user training and retraining as users move from one computer manufacturer to another manufacturer
- By making more data available to a wider range of end users
- By extending application personalization to the end user
- By reducing the skill level required to access and maintain the data and application
- By providing MIS purchasing organizations the freedom to pursue purchasing policies for computer hardware and operating systems independent of the user interface and application development requirements

*How Does FREEFORM/U*DB*OS Save Application Developers Time And Money Now While Protecting Their Future?*

- By producing better applications more quickly and efficiently
- By easily and quickly sharing applications developed by one developer with another developer or user
- By easily and quickly sharing developed applications with developers on disparate systems (PC to VAX to UNIX to Macintosh to ?)
- By easily sharing data from multiple databases
- By easily sharing data among different computer types
- By greatly reducing maintenance of applications on disparate systems

What applications have been implemented using FREEFORM?

Market research, operations research, forecasting, performance data gathering and reporting, back office accounting for brokerage operations, general ledger, accounts payable, accounts receivable, inventory control, ordnance control, storage and retrieval of CAD/CAM design information, document storage and retrieval including key word searches and sounds like searches, bill of materials implosion and explosion, telephone routing and control, warranty claim processing, software and hardware on-line maintenance reporting, personnel reporting and maintenance, law office management and litigation support, and others.

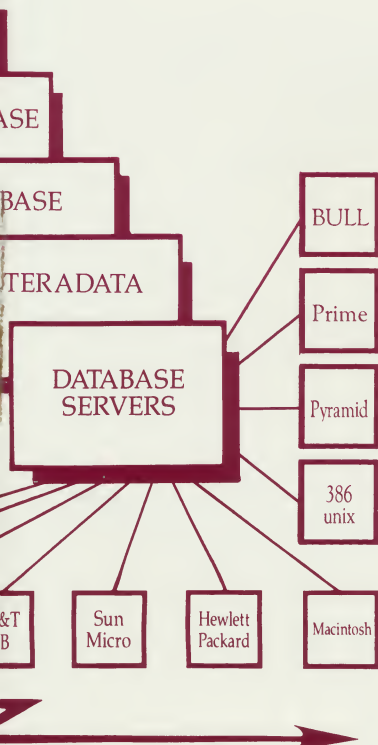


SUN EVERYWHERETM

*Why Will FREEFORM/U*DB*OS Save Application Development Managers And Application Developers Time And Money While Protecting Their Future?*

FREEFORM builds and runs computer applications that are hardware, operating system, and database independent. In addition, **FREEFORM** is a query tool and APPLICATION SERVERTM. This easy to use yet very comprehensive tool set resides on a client or host computer accessing a relational database engine/server.

RM Universal DataBase Operating System (U*DB*OS)



The **FREEFORM** development environment is a completely integrated forms builder, report writer, and automatic documentation system. Most application constructs are presented in a series of nested menus.

FREEFORM also automatically accesses the database dictionary to begin the application building process. In so doing, **FREEFORM** provides some 8 different default forms and reports that easily become the basis for a rapidly developed prototype or the beginnings for a sophisticated production application. Unless overridden by the developer, all **FREEFORM** developed applications automatically generate the SQL necessary for immediate ad hoc queries, appends, deletes, and changes. **FREEFORM** handles 15 way joins and supports both inner and outer joins.

For the professional programmer, a 170 key word language augments the automatic capabilities of **FREEFORM**. This language implements all the basic programming constructs including arithmetic operations, character string manipulation, structured

programming, custom scrolled regions, looping, referential integrity, complex menus, multiple channel database access, nested windows, numeric to character and character to numeric conversions, date arithmetic, and much more.

FREEFORM generates executable object code. **FREEFORM** can either store this code on the client or the database. Consequently, any **FREEFORM** application will immediately execute on any **FREEFORM** client accessing that server even if that **FREEFORM** client is of a different manufacturer and different operating system. For example an application built on a an IBM PC would immediately execute on a VAX/VMS system, Apple Macintosh, or on a SUN Sparcstation *without recompilation*.

FREEFORM looks and feels the same on all clients. All client computers and connected servers simply become homogenous commodities to the developer/user.

What database servers and client/host computers are *currently* supported by **FREEFORM**?

Database Servers - Teradata
ShareBase, Oracle, SYBASE,
Nucleus, XDB, DB2

Client/Host Computers - AT&T 3B,
Alpha Micro, Apple Macintosh,
CDC 4XXX, DOS PC, Hewlett
Packard, MIPS, Prime, Pyramid,
Sequent, SUN4, VAX/VMS, BULL,
VAX/Ultrix, 386 interactive unix

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DIMENSION

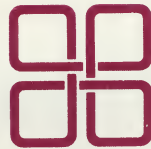
About . . .
Dimension Software Systems, Inc.
Creators of FREEFORM

Dimension Software Systems, Inc. is a Texas corporation that began developing the **FREEFORM** software product in 1982. Actual product marketing began in 1983 and over 100 installations have benefited from this unique approach to database management since then. The product was initially developed to allow users to access the ShareBase relational database machine. As the product evolved, the ability to connect other hardware systems into one database environment became an integral part of **FREEFORM**.

Initial versions of the product were marketed extensively into the ShareBase world and today **FREEFORM** is the leading database application generating software product in that environment. The **FREEFORM** installed user base reads like the *Who's Who* of Corporate business, governmental agencies, and large financial institutions, both domestically and abroad. Many of the systems are mission critical applications justifying **FREEFORM's** well deserved reputation for dependable performance under multi-user, high

transaction operating conditions. Dimension Software Systems (DSS) is a team of highly experienced database programming and support professionals who have worked together for many years to provide excellent training and application development support for the **FREEFORM** product.

FREEFORM products are marketed directly by DSS or by company licensed OEM's and resellers in specific market segments. Support is provided directly by DSS trained personnel.



DIMENSION

Dimension Software Systems, Inc.
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(214) 580-1045

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Macintosh is a registered trademark of Apple Computers
SUN is a registered trademark of Sun Microsystems

Who Uses FREEFORM?

U.S. NAVY

3M COMPANY

PHILIP MORRIS

McDONNELL DOUGLAS

BARCLAYS OF LONDON

AT&T AND AFFILIATES

DEPARTMENT OF DEFENSE

PRODUCTS DIVERSIFIED, INC.

LORAL INFORMATION DISPLAY SYSTEMS, INC.

PROCTER & GAMBLE COMPANY

BUREAU OF THE CENSUS

J. PAUL GETTY TRUST

SOUTHWESTERN BELL

WESTINGHOUSE

LAWTEK

DUPONT

NCR

AND OTHERS

WHAT IS FREEFORM ?

A HARDWARE INDEPENDENT AND DATABASE INDEPENDENT INTEGRATED APPLICATION DEVELOPMENT AND QUERY ENVIRONMENT FOR RELATIONAL DATABASES.

- QUERY TOOL
- SCREEN/FORMS BUILDER
- REPORT WRITER
- 170 KEYWORD PROCEDURAL LANGUAGE
- AUTOMATIC DOCUMENTER
- EFFICIENT RUNTIME ONLY SYSTEM
- UTILITIES
- APPLICATION SERVER

APPLICATION DEVELOPERS CHECKLIST

The following checklist can be used to evaluate an application development environment as to functionality and suitability for your organization. All the functionality below is implemented in FREEFORM, the new standard for application developers, End Users, and relational databases.

OPERATIONAL FEATURES

- _____ May be used by End Users for simpler applications
- _____ May be used by Professional Programmers for complex applications
- _____ Developed applications are Operating System Independent
- _____ Developed applications are Client Hardware Independent
- _____ Developed applications are Database Independent
- _____ Automatic ad hoc Query Capability
- _____ Automatic Data Maintenance Forms(2)
- _____ Automatic Report Outputs(6)
- _____ Completely integrated query tool, forms builder, and report writer
- _____ Simple Application Transfer Between Disparate Clients
- _____ Automatic Documentation Capability
- _____ Complete Application Server Capability
- _____ Automatic Spreadsheet, Mail Merge, etc. Output Formats
- _____ Rapid prototyping capability
- _____ Comprehensive demo system available
- _____ Ability to store and retrieve applications from the database

USER INTERFACE

- _____ Automatic ad hoc Query capability, forms and reports
- _____ Capability to create simple forms
- _____ Capability to create complex forms
- _____ Capability to create simple reports
- _____ Capability to create complex reports
- _____ Capability to create simple menus
- _____ Capability to create complex menus
- _____ Automatic add, change, delete, view, report screens
- _____ Capability to create straight text screens
- _____ Capability to create display screens
- _____ Data checking on data entry
- _____ Table verification on data entry
- _____ Reverse video control
- _____ Blinking data entry fields
- _____ Box and Line drawing support for all clients
- _____ Bold/high intensity displays
- _____ Color support
- _____ Calculated fields display
- _____ Display of HELP information on screens
- _____ Display of HELP information on pop_up_windows
- _____ Display of HELP information on pop_up_forms
- _____ Capability to generate very complex screens

- _____ Ability to generate master/detail listings
- _____ Ability to print screen layout document
- _____ Ability to completely document screen/report
- _____ Ability to nest applications _____ deep
- _____ Ability to have simultaneous/multiple channel access to multiple databases

APPLICATION DEVELOPMENT

- _____ Program editor
- _____ User defined program editor
- _____ Error message display
- _____ Error message trapping
- _____ If then-else logic
- _____ Looping logic
- _____ Programmer's language(170 keywords)
- _____ Structured Programming support
- _____ Language integration
- _____ Ability to embed queries in procedures
- _____ Ability to share temporary data
- _____ Global variable support
- _____ Ability to create local variables
- _____ Complete arithmetic/calculation support
- _____ Complete character string manipulation support
- _____ Fully functional trace capability
- _____ Syntax/error checking
- _____ Function Definition support
- _____ Ability to share Functions
- _____ Ability to define calculations using field values
- _____ Array Support
- _____ Variable Array Indexing Support
- _____ Data Encryption/Decryption Support
- _____ Environment definition support
- _____ Batch processing support
- _____ Keyboard redefinition support
- _____ Foreign language support

DATA MANAGEMENT

- _____ Automatic SQL generation
- _____ Ability to override automatic SQL generation
- _____ Ability to create/drop tables without knowledge of SQL
- _____ Basic data dictionary
- _____ Synonym, alias, and view support
- _____ Headings, titles, or labels support
- _____ Comments or remarks
- _____ Data formats
- _____ Time formats
- _____ Money formats
- _____ Variable-length fields
- _____ Capable of handling _____ #chars/field
- _____ Capable of handling _____ #fields/record
- _____ Keyed or indexed files
- _____ Data structure management
- _____ Ability to read, query, or report from ASCII files

- _____ Ability to import ASCII files
- _____ Ability to export ASCII files
- _____ Ability to read, query, or report from formatted files
- _____ Ability to import formatted files
- _____ Ability to export formatted files
- _____ Ability to modify files while loading
- _____ File check when loading
- _____ File modification when loading
- _____ Ability to support 15 way joins
- _____ Binary file and transfer support

REPORT WRITING FEATURES

- _____ Default report formats provided for paging and headings
- _____ Default report formats provided for summary functions
- _____ Default report selections provided for ascending sorts
- _____ Default report selections for descending sorts
- _____ Simple reporting options for:
 - _____ User specified spacing
 - _____ Table lookups
 - _____ Headings
 - _____ Footers
 - _____ Odd size printouts
 - _____ Forms printing
 - _____ Column totals and subtotals
 - _____ Percent formats
 - _____ Zero suppression
 - _____ Floating dollar signs
 - _____ Comma option for numeric fields
 - _____ Suppressed fields
 - _____ Calculated fields
 - _____ Specific field placement
 - _____ Before group break trigger
 - _____ After group break trigger
 - _____ Output device independence
 - _____ Output device adjustments

LANGUAGE FEATURES

- _____ SQL implementation
- _____ Simple queries on one table
- _____ AND OR complex logic - multiple tables
- _____ Complex Boolean logic
- _____ Traps command or statement errors
- _____ Facilitates correction of errors
- _____ Very comprehensive interpreter language
- _____ Condition logic
- _____ Looping logic
- _____ Intrinsic date/time functions
- _____ Ability to process missing data
- _____ Character to numeric conversions
- _____ Numeric to character conversions

IMPLEMENTATION FEATURES

- _____ Interface to other software packages
- _____ Interface to other languages
- _____ Interface to operating system
- _____ Online HELP
- _____ Documentation
- _____ Interface to external editor/word processor
- _____ Error messages and warnings
- _____ Ability to embed queries in procedures
- _____ Ability to share temporary data
- _____ Support for global variables
- _____ Ability to create local variables
- _____ Ability to define calculations using field values

FREEFORM/U*DB*/OS

APPLICATION DEVELOPMENT OVERVIEW

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PURPOSE

The purpose of this document is to acquaint the application developer with FREEFORM, an application development environment.

WHAT IS FREEFORM?

FREEFORM builds and runs computer applications that are hardware, operating system, and database independent. In addition, FREEFORM is a query tool and application server. This easy to use yet very comprehensive tool set resides on a client or host computer accessing a relational database engine/server.

The FREEFORM development environment is a completely integrated forms manager, report writer, and automatic documentation system. Most application constructs are presented in a series of nested menus. FREEFORM also automatically accesses the database dictionary to begin the application building process. In so doing, FREEFORM provides some 8 different default forms and reports that easily become the basis for a rapidly developed prototype or the beginnings for a sophisticated production application. Unless changed by the developer, all FREEFORM developed applications automatically generate the SQL necessary for immediate ad hoc queries, appends, deletes, and changes.

For the professional programmer, a 170 key word C like language augments the automatic capabilities of FREEFORM. This language implements all the basic programming constructs including arithmetic operations, character string manipulation, structured programming, custom scrolled regions, looping, referential integrity, complex menus, multiple channel database access, nested windows, numeric to character and character to numeric conversions, date arithmetic, and much more.

FREEFORM generates executable object code. FREEFORM can either store this code on the client or the database. Consequently, any FREEFORM application will immediately execute on any FREEFORM client accessing that server even if that FREEFORM client is of a different manufacturer and different operating system. For example an application built on a an IBM PC would immediately execute on a VAX/VMS system, Apple Macintosh, or on a SUN Sparcstation without recompilation.

FREEFORM looks and feels the same on all clients. All client computers and connected servers simply become homogenous commodities to the developer/user.

WHO USES FREEFORM

Over 70 Fortune 500 companies, governmental agencies, and large financial institutions, both domestically and abroad, develop and run FREEFORM applications.

WHAT DATABASE SERVERS AND CLIENT/HOST COMPUTERS ARE CURRENTLY SUPPORTED BY FREEFORM?

Database Servers

Teradata
ShareBase
Oracle
Sybase
Nucleus
XDB

Client Computers

AT&T 3B
Alpha Micro
Apple Macintosh
CDC 4XXX
DOS PCs
Hewlett Packard
MIPS
Prime
Pyramid
Sequent
SUN4
VAX/Ultix
VAX/VMS
386 Interactive Unix

WHAT APPLICATIONS HAVE BEEN DEVELOPED USING FREEFORM?

How FREEFORM is used is really a function of the specific database capabilities and the developers needs. Listed below are both decision support and transaction based applications that have been built by FREEFORM developers.

Marketing Research	Sales Forecasting
Operations Research	General Ledger
Inventory Control	Ordinance Control
Storage and Retrieval of	Back Office Accounting for
CAD/CAM Designs	Brokerage Operations
Bill of Materials	Document Storage and Retrieval
Implosion and Explosion	Including Key Word Searches
Telephone Routing and Control	Warranty Claim Processing
Personnel Maintenance and	Software and Hardware On-Line
Reporting	Maintenance and Reporting
Law Office Management and	Division Performance Tracking
Litigation Support	and Reporting
Accounts Payable	Accounts Receivable

and others

HOW IS FREEFORM DIFFERENT?

Hardware, Operating System, and Database Independence

FREEFORM saves application developers time and money now while protecting their future. Other tools generally lock users into a specific database or even specific hardware.

Because FREEFORM is hardware, database, and operating system independent, FREEFORM works and looks the same with many different databases and many different kinds of hardware. Much if not all investment in both training and developed applications is saved when FREEFORM customers expand to other databases and/or client platforms.

Tool Set Integration

Most application development tool sets are not integrated. The forms manager is separate from the report writer and the query tool is separated from them both. FREEFORM users only learn one tool and forms manager, report writer, and query capability are nicely integrated.

Application Server Integration

FREEFORM stores application executables on the database server. Once stored, any application developed by FREEFORM can immediately transfer from the server and execute on any FREEFORM client accessing that server. The FREEFORM client may be of a different manufacturer and different operating system. For example, an application built on an IBM PC could immediately execute on a VAX/VMS system, Apple Macintosh, or on a SUN Sparcstation. This unique FREEFORM feature greatly simplifies application maintenance, application version control, and application transfers to both different databases and different host/client environments. We believe this particular Application Server capability in FREEFORM is not duplicated anywhere else in the industry(pat pending). Developers and end users are able to gain an application server through any FREEFORM supported database server without having to purchase a separate capability.

Windowed Applications

FREEFORM provides a very versatile character based windowing interface that is consistently implemented across all client platforms. Form windows may be nested 4 deep on the screen.

Database Access

FREEFORM can have up to 4 channels open to the database and up to 15 joins in any one form or report. FREEFORM supports equal, inner, and outer joins.

Automatic Documentation System

FREEFORM aids the developer with an automatic documentation system and other utilities for any FREEFORM environment. The

automatic documenter presents a hard copy of the form and summarizes all pertinent information about the application including databases, tables, tab sequences, editing code, hard coded SQL, etc. The automatic documenter greatly enhances remote and on-site application support and transfer.

Other Utilities

Other utilities include table creation, field additions and deletions, table name changes, cross reference listings, and large application maintenance and control.

FREEFORM IS BOTH EASIER TO USE AND TECHNICALLY SUPERIOR

Integration

Less to learn, greater productivity

Executable Object Code

FREEFORM generates executable object code. Developers easily flip from development to testing and back to development.

Automatic SQL Generation

Unless overridden by the developer, FREEFORM automatically generates its own SQL. Ad hoc queries are automatically constructed from a user friendly query by forms approach.

Database Dictionary Access

FREEFORM accesses the database dictionary to retrieve user tables, system tables, field names, field types, and other constraints.

From the retrieved tables, a simple point and click operation selects the appropriate tables, specifies the join type, and which data items to include in the basic application.

Automatic Form, Query, and Report Generation

Automatic Forms

From the selected tables, FREEFORM automatically generates 2 differently formatted forms and 6 report outputs. The 2 automatic forms are fully functional in that users may immediately add, change, delete or ad hoc

retrieve records from single, multiple, or multiply joined tables without any knowledge of SQL.

The most widely used automatic form is simply a window with all the data items positioned in the window. The names, lengths and data types are as retrieved from the database. Should the data items be too many to fit one screen, they will overflow onto additional virtual screens. FREEFORM forms displays can be up to 320x25 or 4 virtual screens.

The other form display is a scrolled region running as far right as needed to get the entire record on one line. This scrolled region will be as deep as however many records will fit into a FREEFORM buffer. Navigation through the scrolled region is with arrow and tab keys.

Both displays allow record perusal backward and forward through the buffer. Once the next record in the next buffer is selected, FREEFORM flushes the prior buffer and refills the display until the user aborts the exercise or the retrieval is satisfied.

Automatic Reports

The other automatic outputs are report displays. The standard automatic FREEFORM report output is simply a wrapped data line. Unless changed by the developer, the column names will be the data names from the database. The other 5 automatic report formats available allow FREEFORM to generate outputs that will directly feed LOTUS and other commonly used packages. The output formats supported are standard data, comma-delimited, data interchange, tabbed to ascii, and mail merge.

Automatic Queries

For both reports and forms, any subset of the data can be retrieved and FREEFORM allows the user to simply direct the data to one of report displays through an easy to use query-by-forms approach.

Any data item can be qualified as to equal to, greater than, less than, greater than or = to, less than or = to, not equal to, beginning character strings, ending character strings, positional character strings, wildcards, etc. And qualifiers are implicit between the fields. Or qualifiers can be used in multiple occurrences on single fields, between different fields, and to define whole new groups of qualifiers. FREEFORM automatically generates all the necessary SQL and allows the user to see the generated statements if desired. Queries can be saved and retrieved and can become quite

complex. If desired, the developer can override any query with custom SQL.

Rapid Application Prototyping

These automatic outputs provide either a prototyped application with little work or the starting point for developing a comprehensive installation.

COMPREHENSIVE PRODUCTION APPLICATION DEVELOPMENT

In developing a comprehensive production application, the developer/user has five major FREEFORM facilities at his disposal. These facilities are the FREEFORM forms manager, the FREEFORM report writer, the FREEFORM procedural language, the developer controlled FREEFORM environment, and the FREEFORM run time system. Each is used as needed by the user/developer.

Forms Management

The first facility is simply an intuitive arranged, comprehensive set of nested menus. These point and click options range from controlling background form color to query optimization parameters with full schema modification capabilities. Form and field options include the following:

Form Options

- Window Size
- Window Location
- Form Title
- Unique Record Retrieval Switch
- Retrieval Sorting Constraints
- Foreground Color
- Background Color
- Window Frame Type
- Query Plan Setting
- Entry Logic Trigger
- Exit Logic Trigger
- Redraw Logic Trigger

Statics

- Boxes
- Lines
- Text
- Highlight Codes

Schema

- Database

Field Options

- Field Width
- Query Width
- Display Width
- Display Height
- Data Type
- Foreground Color
- Background Color
- Display Highlighting
- Pre-logic Trigger
- Verify-logic Trigger
- Post-logic Trigger
- Help-logic Trigger
- Automatically Return
- Automatically Repeat
- Update Security Switch
- Read Only Switch
- Force Uppercase
- Force Lower-case
- Force Verify Logic on Retrieves
- Input Mandatory
- Tab to Next Field Only
- Force Verify Logic on

Relations
Attributes
Joins

Other

Expert Mode
Next Screen
Previous Screen
Move Block
Hotkey

Display Style

Force Alphabetic, Numeric
Center, Left, Right Align
Padding Character, Strip Blanks
Zero Suppress, Floating \$
Comma Separated
Period Separated(European Format)
Date, Time, SSN, Phone Displays
And others

Updates
Updates Mandatory
Echo Character Override
Fill Character Override
Contact Sensitive Help Form
Display Style
Special Process Logic
Contact Sensitive Help
Find Field
Locate Field
Next Field
Previous Field
Remove Field
Change Text
Range Checking
Kill Field
Identify Field

A quick scan of the items above show that novice developers and end users can go quite far in moving toward a sophisticated production application by simply selecting menu options.

Report Writer

The second capability for producing a comprehensive production application is the FREEFORM report writer. A FREEFORM report is a tabular presentation of the database information. Each record retrieved from the database is formatted and output.

As stated above, every form built with FREEFORM's Form Builder has 6 automatic reports associated with the form. In many cases, the automatic reports are all that is required. The developer can rearrange the automatic report(s) or if more customization is desired, the Report Writer is invoked.

Report output can be directed to the screen, a disk file or a system printer. The direction is designated in the form or set at run time. Run time designation gives the user the ability to view a report on the terminal screen before printing.

Like the forms manager, the Report Writer uses many of the same commands that are in the Forms Manager. The Report Writer also presents a very visual representation of a typical report.

The Header section, Body section, and Footer section are all displayed on the same screen thereby giving the developer the ability to see how each item aligns as the developer formats the report. Each of the three sections scrolls to allow the user to input a larger number of lines than is available on the initial display. A ZOOM command provides a full screen view for each section should the developer need to see a larger display. The custom built report is saved with the form and replaces the automatic report. Other Report Writer features are listed below.

- * A report may include a title page, end page, page header, and page footer.
- * Trigger code from the FREEFORM Interpreter may be included with each title page, end page, page header, and page footer.
- * Report size is unlimited.
- * Each report line can be up to 255 characters.
- * Printer setup strings are supported.
- * Batch mode report generation is supported.
- * Sorting is available for all fields irrespective of location or display status in the report.
- * Unlimited field groupings and breaks are supported.
- * Totaling and averaging of numeric fields is supported. Subcounts and grandcounts are supported for all fields.
- * Subtotals may be created and be accessed for any field with respect to any grouping.
- * Trigger code is supported both before and after group breaks.
- * Any field may be arithmetically or otherwise modified before or after printing. Intermediate results may be saved in user defined variables, arrays, etc.
- * Summary and cross tabular reports are supported
- * If the tabular report format is not desired, free-style report generation can be accomplished with the FREEFORM Interpreter language. Virtually any display may be created with the Interpreter.

Procedural Language(Interpreter)

The third avenue for producing a production application is aimed more at the professional programmer. FREEFORM has a comprehensive 170 keyword language that supports, arrays, all arithmetic operations, begin-end structured programming, triggered SQL, referential integrity, transaction control, transaction error checking, database triggers, date manipulation, pattern matching, multiple database access, encryption and decryption of data, numeric to ASCII and ACSII to numeric data conversions, character string manipulation, if-then-else logic, looping, debugging capabilities, syntax checking, terminal formatting, third generation language interfaces, and much more.

The professional developer is limited only by imagination in using this facility. The language is invoked from triggers for the form, form variables, attributes, and from key control points in the report writer. Below is a list of the keywords in this language.

FREEFORM Interpreter Keywords

ABORTX	DEFMENU	IDATE
ACCEPT	DESTROY	IDMDATE
AND	DISABLEBREAKS	IDMERRNO
ARRAY	DISABLEFOOTERS	IDMNODE
ASSIGNKEY	DISABLEHEADERS	IDMTIME
AUTO_ENTER	DISPLAY	IF
BATCHMODE	DO	INPUT_NEXT
BEEP	DONE	INSTRING
BEGIN	DONECOUNT	INTERRUPTED
BEGINX	DONESTATUS	INTERPRET
BREAK	DRAWSQ	IS_FUNCTION
BREAK_ON	EDIT	ISNUMERIC
CANCEL	EJECT	IS_RUNONLY
CANCELP	ELSE	ITIME
CHAIN	END	LEFT
CHANNEL	ENDX	LINENUMBER
CHECK_DATE	EXECUTE	MATCHES
CHECK_TIME	EXIT	MESSAGE
CLEAR	EXIT_FORM	MULTILINE
CLEARCURRENT	EXIT_FREEFORM	MULTILINE_KEY
CLEARNEW	EXPORTFORM	MULTI_RECKEY
CLEAR_RELATION	FF_ALLOCED	MUST_INPUT
CLEAR_SCREEN	FF_MBREAK	NEWVAL
CLOSE	FF_PREFLIST	NEXT_ONLY
CLOSEDB	FOOTERSIZE	NEXTTUPLE
CLRMSG	FORCE_PROCESSING	NOT
COMMITDATA	FREE	NO_AUTO_PROCESS
CONTINUE	FUNC	NO-AUTO_QUERY

COPY	GET_DBM_DATE	OPEN
COPYBINARY	GET_DBM_TIME	OPENDB
CRYPT	GETSYM	OPROMPT
CURSOR_COL	GLOBAL	OR
CURSOR_ROW	GOTO	OR_QUALIFYKEY
CURVAL	GRANDAVERAGE	PAGEBACK
DATE	GRANDCOUNT	PAGEFORWARD
DBIN	GRANDTOTAL	PAGELNGTH
DCL	HEADERSIZE	PAGENUMBER
DECRYPT	HOLDSCREEN	PAGEWIDTH
DEFDB	IAND	PATTERN
POP_UP_FORM	SETNAME	TRACE_OFF
POP_UP_MENU	SETPASSWORD	TRACE_ON
POSCUR	STRLEN	TUPLINE
PREVTUPLE	SUBAVERAGE	UNDRAWSQ
PRINT	SUBCOUNT	USER
PRINTBUF	SUBSTRING	USER_NAME
PRINTS	SUBTOTAL	USING
QUALIFY	SYSTEM	VALUEENTERED
RECONFIGURE	TABTO	VAR
REDRAW	TCLOSE	VERSION
REJECT	THEN	VIDEO
RETURN	TIME	WAIT
RIGHT	TOASCII	WDISPLAY
SCREEN	TOLOWER	WHILE
SETBREAK	TONUMERIC	
SETCHANNEL	TOPEN	
SETCUR	TOUPPER	

Environment Tokens

In addition, the developer may often find it desirable to better define the environment that runs FREEFORM before actually beginning development. These tokens provide for overall defaults in application building, communication fine tuning, security, owner verification, displaying generated SQL, batchmode operation, and much more. These tokens are set at FREEFORM startup.

One of the more popular features implemented through this capability is which editor the user will select. While FREEFORM has its own editor, the user may select another editor to his liking. Since that feature is client specific, developers or end users may use many different editors.

FREEFORM may store the application locally or on the server. Another token, FF_PREFLIST, allows the developer to specify a path for FREEFORM to search when seeking the application executable. The path may be to LOCALDIR1, LOCALDIR2, REMOTESER1, and/or the database server. Application maintenance, new production modules, and even new versions of FREEFORM are easily maintained in this manner. FREEFORM can store and

retrieve both FREEFORM applications and other non FREEFORM applications from the server. Some of the other environment tokens are listed below.

General Tokens

FF_DBDELIM	Database delimiter
FF_BACKGROUND	Default background color
FF_DATABITS	Default is 8 bits, can be defined to 7 bits
FF_DEFDB	Default database opened on startup
FF_DEFMENU	Default screen run on startup
FF_DEFVIDEO	Default window video attribute
FF_EDITOR	FREEFORM default system editor
FF_ENVFILE	File to read more env from
FF_EXEC	User optional name for EXEC
FF_EXPERT	Hide Modify and Report menu options
FF_FOREGROUND	Default foreground color
FF_FORMFEED	If value use FF in report output
FF_GRAPHICS	Control line drawing
FF_IOBSIZE	FREEFORM I/O buffer size
FF_MESSAGES	Directory for msg files
FF_MODE	User optional name for MODE
FF_MONOCHROME	Disable color output
FF_PREFLIST	List of prefixes for file opens
FF_QUIET	Exit quietly
FF_SAVEWARN	Warn of trashing altered forms
FF_STATISTICS	Print statistics on queries
FF_TIMEZONE	Time base - Current database server time
FF_TTYPE	Type in RELATION relation of tables
FF_USEROUT	Timeout on keyboard input
FF_USREXIT	Automatic exit after time out
FF_WINDOWFILL	Default window fill character
IDM_BATCHMODE	Batch mode control
IDM_CAPTURE	File to track keystrokes
IDM_CHAN	Reserved for FREEFORM use
IDMCOM	Reserved for FREEFORM use
IDM_IMAGE	File for image dumps
IDM_LOGIN	Control automatic logins
IDM_SCRIPT	Input script file
IDM_STANDALONE	Disable all database server access
IDM_TRACE	File for trace dumps

Verification Tokens

VER_OWNER	Registered License Owner name
VER_EXPIRE	Demonstration expiration YYYYMMDD
VER_NUMBER	Encrypted license info verification
VER_SERIAL	FREEFORM license serial number

RS232 Communication Tokens

IDM_BRKSETTLE	Ticks for line settle delay(IBM)
IDM_CMDTIME	RS232 Command packet timeout
IDM_DATETIME	RS232 Data packet timeout
IDM_HELLOTIME	RS232 Hello packet delay
IDM_MODEM	Modem control - PC versions
IDM_PACKET	Limit packet size
IDM_SPEED	Channel speed - PC versions
IDM_RETRIES	RS232 Retry count on errors

RS232 Communication PC Tokens

IDM_PID	User specified PID (PCs only)
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Security Tokens

IDM_HOSTID	Default server Host ID
IDM_HUID	Default HUID for initial identify

FREEFORM Run Time System - FREERUN

For production applications, FREEFORM provides a run only version of the product called FREERUN. The FREERUN user cannot modify the application that has been built by the developer. The FREERUN user does however have all the ad hoc query capabilities of FREEFORM at run time unless limited by the developer.

FREEFORM AND THE DEVELOPER/USER COMMUNITY

While this paper is a brief technical introduction, it by no means shows all the considerable capabilities of FREEFORM. An underlying theme is that FREEFORM has various levels of usefulness to the organization and to developer/users. On one extreme is the professional programmer that both understands data processing and FREEFORM. On the other extreme is a user that runs a production application and little more.

In between are managers that make automatic reports from their own queries. Others can build an application once the database has been built. Still others can personalize their applications in their area of responsibility.

FREEFORM's design allows user/developers to seek a level of understanding with the product that is comfortable to them without having to be a professional programmer. Used in this manner, FREEFORM is productive and beneficial at all levels in the organization, not just to the professional programmer. Consequently, more data is invariably moved to to a wider range of users. As usage grows, more users find more uses for the product. One professional may support many developer/users. We see a significant organizational benefit in our approach. Thank you for considering FREEFORM for your software development needs.

Dimension Software Systems, Inc. offers the following educational courses:

a) FREEFORM Basic Training Class:

This is a three-day course that can be held on site at DSS or at your location. The cost is \$995.00 per person (plus expenses) and provides detailed basic training for new FREEFORM users or users new to release 7.2. It covers basic form building, report writing, and Interpreter code.

b) FREEFORM Overview: New Features of Release 7.2:

This is a one day course held on site at DSS and the fee is \$395.00 per person (plus expenses). This course is designed for experienced FREEFORM users who require a non in-depth explanation of the new features contained in release 7.1 and upwards.

c) FREEFORM For Experts:

This is a two-day training course for advanced FREEFORM users and the fee is \$795.00 per person (plus expenses). This course covers advanced form concepts, freeform report writing, and advanced Interpreter code functions.

**** All of the above courses can be held at the customer's site if requested. ****

For more detailed information on the above courses, please contact Renea Youngker at (214) 580-1045.

FREEFORM Basic Training Class Schedule for 1992

(Held on site at DSS in Texas)

January	14, 15, 16, 1992
February	18, 19, 20, 1992
March	17, 18, 19, 1992
April	14, 15, 16, 1992
May	12, 13, 14, 1992
June	16, 17, 18, 1992
July	14, 15, 16, 1992
August	18, 19, 20, 1992
September	15, 16, 17, 1992
October	13, 14, 15, 1992
November	17, 18, 19, 1992
December	15, 16, 17, 1992

NOTE: The cost of \$995 (per attendee) for the Basic Training Class includes cost of class materials (workbook and reference manual).

DSS will conduct training classes at your site. Please call for details.

For more information or to register for a class, please call Renea Youngker at (214) 580-1045.

FREEFORM
7.2 BASIC TRAINING
(for SQL Servers only)

DAY ONE:

1. Introduction to DSS
2. FREEFORM introduction
 - a. The DBA utilities
3. The FREEFORM Form builder
4. Modify menu
5. Work at terminals
 - a. Build Simple Form
 - b. Apply options - Modify menu

DAY TWO:

1. The Report Writer
2. The Report Writer option menus
3. Work at terminals
 - a. Build simple reports
 - b. Apply options - report options menu
4. Explanation of FREEFORM's environment

DAY THREE:

1. Multiple record viewing
2. Pop up menus
3. Pop up forms
4. Message file manipulation
5. Saved query recall
6. Range checking
7. Interpreter
8. Functions - subroutines
9. Summary Q & A
10. Evaluation

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